Journal of Nuclear Materials 153 (1988) 239–240
North-Holland, Amsterdam

AUTHOR INDEX

Assmann, H., M. Peehs and H. Roepenack, Survey of binary fuel manufacturing and quality control 153 (1988) 115
Assmann, H., see Maier 153 (1988) 213

Bălan, V., see Glodeanu 153 (1988) 156
Balek, V., Application of emanation thermal analysis for characterization of intermediate products of urania and thoria ceramics 153 (1988) 41
Bauer, E., see Dams 153 (1988) 108
Baumann, R., see v. Wachtendonk 153 (1988) 91
Baumann, S., see Dams 153 (1988) 108
Benedict, U., see Richter 153 (1988) 205
Blank, H., Specification and characterization of dense fuels for liquid metal cooled fast breeder reactors 153 (1988) 171

Campsie, I.C. and H.D. Rattray, Inspection procedures for experimental fuel production 153 (1988) 141
Chang, I.S., see Choi 153 (1988) 148
Chilton, G.R. and K.J. Wilson, Aspects of the certification of experimental mixed oxide fuel and fuel pins for use on the UK fast reactor programme 153 (1988) 127
Choi, C.S., J.H. Park, E.H. Kim, H.S. Shin and I.S. Chang, The influence of AUC powder characteristics on UO_2 pellets 153 (1988) 148

Dams, W., R. Krause and K.-H. Nelges, Determination of plutonium concentration and plutonium isotopic composition in mixed oxide fuels 153 (1988) 86
Dams, W., E. Bauer, S. Baumann and R. Krause, New methods for the determination of impurities in $(Pu,U)O_2$ fuels 153 (1988) 108
De Lima, N.B., see Imakuma 153 (1988) 76
Dörr, W., see Maier 153 (1988) 213

Elbel, H. and D. Vollath, Experimental correlations between pore structure and thermal conductivity 153 (1988) 50
Elbel, H., J. Klews and R. Löb, Dependence of the UO_2–PuO_2 pellet structure on fabrication parameters 153 (1988) 160
Elbel, H., see Ritzhaupt-Kleissl 153 (1988) 221
Eriksson, S., see Hälldahl 153 (1988) 66

Fischer, P., see Ledergerber 153 (1988) 189

Ganguly, C., G.C. Jain, J.K. Ghosh and P.R. Roy, The role of "Process Control" and "Inspection" steps in the quality assurance of SS 316 clad mixed plutonium–uranium carbide fuel pins for FBTR 153 (1988) 178
Geyer, F., E. Mainka and H.G. Müller, The influence of high uranium, plutonium and gadolinium concentrations, respectively, on emission spectroscopy assays for selected elements 153 (1988) 102
Ghosh, J.K., see Panakkal 153 (1988) 82
Ghosh, J.K., see Ganguly 153 (1988) 178
Glodeanu, F., M. Spinzi and V. Bălan, Correlation between UO_2 powder and pellet quality in PHWR fuel manufacturing 153 (1988) 156
Goelbecker, J., Quantitative image analysis of unirradiated fast breeder reactor fuel 153 (1988) 59
Grigoletto, T., see Imakuma 153 (1988) 76
Gueugnon, J.F., see Richter 153 (1988) 205

Hälldahl, L. and S. Eriksson, Characterization of homogeneity in $(U,Gd)O_2$-pellets 153 (1988) 66
Heck, M., see Ritzhaupt-Kleissl 153 (1988) 221
Herbst, R., see Ledergerber 153 (1988) 189

Imakuma, K., see Riella 153 (1988) 71
Imakuma, K., H.G. Riella, A.R. Lordello, S.S. Iyer, S.F. Sabato, T. Grigoletto, O. Vega, V.L. Salvador, M.H. Kakazu, M.A.F. Pires and N.B. De Lima, Fuel characterization techniques: Current methods practised at the Instituto de Pesquisas Energéticas e Nucleares, Brazil 153 (1988) 76
Iyer, S.S., see Imakuma 153 (1988) 76

Jain, G.C., see Ganguly 153 (1988) 178

Kakazu, M.H., see Imakuma 153 (1988) 76
Kamimura, K., see Takahashi 153 (1988) 232
Kim, E.H., see Choi 153 (1988) 148
Klews, J., see Elbel 153 (1988) 160
Kopff, G., The quality analysis system implemented by FRAGEMA 153 (1988) 27
Krause, R., see Dams 153 (1988) 86
Krause, R., see Dams 153 (1988) 108
Kutter, H., see Ledergerber 153 (1988) 189
Kutter, H., see Richter 153 (1988) 205

Ledergerber, G., R. Herbst, H.U. Zwicky, H. Kutter and P. Fischer, Characterization and quality control of uraium–plutonium carbide for the AC-3/FFTF experiment 153 (1988) 189
Löb, R., see Elbel 153 (1988) 160
Lordello, A.R., see Imakuma 153 (1988) 76

Maier, G., H. Assmann and W. Dörr, Resinter testing in relation to in-pile densification 153 (1988) 213
Mainka, E., see Geyer 153 (1988) 102
Martinez, L.G., see Riella 153 (1988) 71
Masuda, S., see Takahashi 153 (1988) 232
Michiels, A., see Verdingh 153 (1988) 96
Mühling, G., see Richter 153 (1988) 205
Müller, H.G., see Geyer 153 (1988) 102

Nechaev, A., see Noe 153 (1988) 19
Nelges, K.-H., see Dams 153 (1988) 86
Noe, M., A. Nechaev and J.L. Zhu, International co-operation for quality assurance and quality control in water reator fuel fabrication 153 (1988) 19

Panakkal, J.P. and J.K. Ghosh, A simple model for neutron radiography of uranium–plutonium mixed oxide fuel pins 153 (1988) 82
Park, J.H., see Choi 153 (1988) 148
Peehs, M., see Assmann 153 (1988) 115
Pelckmans, E., Feed-back of quality control data evaluation to production experience of mixed uranium–plutonium dioxide fuels 153 (1988) 133
Pires, M.A.F., see Imakuma 153 (1988) 76

Rattray, H.D., see Campsie 153 (1988) 141
Richter, L., U. Benedict, J.F. Gueugnon, H. Kutter, C. Sari and G. Mühling, Specification, fabrication and characterization of (U,Pu)C fuel 153 (1988) 205
Riella, H.G., L.G. Martinez and K. Imakuma, Determination of crystallite size in UO_{2+x} powder by X-ray diffraction 153 (1988) 71
Riella, H.G., see Imakuma 153 (1988) 76
Ritzhaupt-Kleissl, H.-J., H. Elbel and M. Heck, Influence of design parameters on the operational behaviour of fuel pins 153 (1988) 221
Roepenack, H., see Assmann 153 (1988) 115
Roy, P.R., see Ganguly 153 (1988) 178

Sabato, S.F., see Imakuma 153 (1988) 76
Salvador, V.L., see Imakuma 153 (1988) 76
Sari, C., see Richter 153 (1988) 205
Shin, H.S., see Choi 153 (1988) 148
Spinzi, M., see Glodeanu 153 (1988) 156
Stehle, H., Performance of oxide nuclear fuel in water-cooled power reactors 153 (1988) 3

Takahashi, K., K. Kamimura, T. Yamaguchi and S. Masuda, Development of quality control data base "DANTE" and relational analysis between fission gas release behavior and plutonium homogeneity in mixed oxide fuel by DANTE 153 (1988) 232

Vega, O., see Imakuma 153 (1988) 76
Verdingh, V. and A. Michiels, A computer controlled potentiometric titrator for quantitative determination of uranium 153 (1988) 96
Vollath, D., see Elbel 153 (1988) 50
v. Wachtendonk, H.-J. and R. Baumann, Automated simlutaneous determination of Gd_2O_3 and ^{235}U contents during production 153 (1988) 91

Wilson, K.J., see Chilton 153 (1988) 127

Yamaguchi, T., see Takahashi 153 (1988) 232

Zhu, J.L., see Noe 153 (1988) 19
Zwicky, H.U., see Ledergerber 153 (1988) 189

Journal of Nuclear Materials 153 (1988) 241–242
North-Holland, Amsterdam

SUBJECT INDEX

AUC-powder characteristics 148

Binary fuel manufacturing 115
  quality control 115

Carbide fuel 170
Certification of mixed oxide fuel 127
Characterisation of
  dense fuels 171
  homogeneity 66
  intermediate products 41
  techniques 76
  uranium–plutonium carbide 189, 205
Chrystallite size 71
Computer controlled titrator 96

Densification 213
Design parameters 221

Emanation thermal analysis 41
Emission spectroscopy 102
Experimental fuel production 127, 141

Fabrication of (U, Pu)C 205
  parameters 160
Fast breeder reactor 127, 171, 221
Feedback of quality control data 133
Fission gas release 232
FRAGEMA 27
Fuel characterization techniques 76
  fabrication 3, 156
  for fast breeder reactors 59
  performance 19
  pins 82, 170, 221
  production 141

Gadolinium, homogeneity of 91
  influence of concentration 102
Gd_2O_3, determination of 91

Homogeneity 66, 232

Influence of concentrations 102
Influence of design parameters 221
  AUC powder characteristics 148
In-pile densification 213
Inspection procedure 141
  steps 170

International cooperation 19
Image analysis 59
Impurity determination 102, 108

Liquid metal cooled fast breeder reactors 171

Mixed oxide fuel 86, 127, 232
  fuel pins 127

Neutron radiography 82

Operational behaviour 221
Oxide fuel 86
  performance 3

Plutonium concentration, determination of 86
  homogeneity 232
  influence of concentration 102
  isotopic composition, determination of 86
  uranium carbide fuel pins 170
Pore structure 50
Potentiometric titrator 96
Power reactors, water cooled 3
Process control steps 170

Quality analysis systems 27
  assurance 19, 170
  control 19, 115, 133, 189, 232
  of pellets 156
Quantitative determination of uranium 96
  image analysis 59

Radiography 82
Relational analysis 232
Re-sinter testing 213

Specification of dense fuels 171
  of (U, Pu)C 205
Spectroscopy, emission 102

Thermal analysis 41
  conductivity 50
Thoria ceramics 41
Titrator, potentiometric 96

^{235}U, determination of 91
UO_2 pellets 148
UO_2 powder 71, 156

(U, Pu)C fuel 205
(U, Pu)O_2 fuels, determination of impurities 108
UO_2–PuO_2 pellet structure 160
Uranium ceramics 41
Uranium–plutonium mixed carbide 170, 189
  oxide 82, 133
  production experience 133
Uranium, quantitative determination of 96

X-ray diffraction 71

CONTENTS

Preface vii

Session 1. Opening and introduction

Performance of oxide nuclear fuel in water-cooled power reactors, *H. Stehle* 3

Session 2 and 3. Quality assurence systems

International co-operation for quality assurance and quality control in water reator fuel fabrication, *M. Noe, A. Nechaev and J.L. Zhu* 19
The quality analysis system implemented by FRAGEMA, *G. Kopff* 27

Session 4, 5 and 6. Methods of characterization

Application of emanation thermal analysis for characterization of intermediate products of urania and thoria ceramics, *V. Balek* 41
Experimental correlations between pore structure and thermal conductivity, *H. Elbel and D. Vollath* 50
Quantitative image analysis of unirradiated fast breeder reactor fuel, *J. Goelbecker* 59
Characterization of homogeneity in $(U,Gd)O_2$-pellets, *L. Hälldahl and S. Eriksson* 66
Determination of crystallite size in UO_{2+x} powder by X-ray diffraction, *H.G. Riella, L.G. Martinez and K. Imakuma* 71
Fuel characterization techniques: Current methods practised at the Instituto de Pesquisas Energéticas e Nucleares, Brazil, *K. Imakuma, H.G. Riella, A.R. Lordello, S.S. Iyer, S.F. Sabato, T. Grigoletto, O. Vega, V.L. Salvador, M.H. Kakazu, M.A.F. Pires and N.B. De Lima* 76
A simple model for neutron radiography of uranium–plutonium mixed oxide fuel pins, *J.P. Panakkal and J.K. Ghosh* 82
Determination of plutonium concentration and plutonium isotopic composition in mixed oxide fuels, *W. Dams, R. Krause and K.-H. Nelges* 86
Automated simlutaneous determination of Gd_2O_3 and ^{235}U contents during production, *H.-J. v. Wachtendonk and R. Baumann* 91
A computer controlled potentiometric titrator for quantitative determination of uranium, *V. Verdingh and A. Michiels* 96
The influence of high uranium, plutonium and gadolinium concentrations, respectively, on emission spectroscopy assays for selected elements, *F. Geyer, E. Mainka and H.G. Müller* 102
New methods for the determination of impurities in $(Pu,U)O_2$ fuels, *W. Dams, E. Bauer, S. Baumann and R. Krause* 108

Session 7 and 8. Relations between fuel characterization and problems in production

Survey of binary fuel manufacturing and quality control, *H. Assmann, M. Peehs and H. Roepenack* 115
Aspects of the certification of experimental mixed oxide fuel and fuel pins for use on the UK fast reactor programme, *G.R. Chilton and K.J. Wilson* 127
Feed-back of quality control data evaluation to production experience of mixed uranium–plutonium dioxide fuels, *E. Pelckmans* 133
Inspection procedures for experimental fuel production, *I.C. Campsie and H.D. Rattray* 141
The influence of AUC powder characteristics on UO_2 pellets, *C.S. Choi, J.H. Park, E.H. Kim, H.S. Shin and I.S. Chang* 148
Correlation between UO_2 powder and pellet quality in PHWR fuel manufacturing, *F. Glodeanu, M. Spinzi and V. Bălan* 156
Dependence of the UO_2–PuO_2 pellet structure on fabrication parameters, *H. Elbel, J. Klews and R. Löb* ... 160

Session 9. Carbide fuels

Specification and characterization of dense fuels for liquid metal cooled fast breeder reactors, *H. Blank* . 171
The role of "Process Control" and "Inspection" steps in the quality assurance of SS 316 clad mixed plutonium–uranium carbide fuel pins for FBTR, *C. Ganguly, G.C. Jain, J.K. Ghosh and P.R. Roy* 178
Characterization and quality control of uraium–plutonium carbide for the AC-3/FFTF experiment, *G. Ledergerber, R. Herbst, H.U. Zwicky, H. Kutter and P. Fischer* 189
Specification, fabrication and characterization of (U,Pu)C fuel, *L. Richter, U. Benedict, J.F. Gueugnon, H. Kutter, C. Sari and G. Mühling* 205

Session 10. Specification, product quality and operating behaviour

Resinter testing in relation to in-pile densification, *G. Maier, H. Assmann and W. Dörr* 213

Influence of design parameters on the operational behaviour of fuel pins, *H.-J. Ritzhaupt-Kleissl, H. Elbel and M. Heck* 221

Development of quality control data base "DANTE" and relational analysis between fission gas release behavior and plutonium homogeneity in mixed oxide fuel by DANTE, *K. Takahashi, K. Kamimura, T. Yamaguchi and S. Masuda* 232

Author index 239

Subject index 241